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Requirements for Good Aquaculture Practices — India GAqP Shrimp Hatchery and Grow Out Farms

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Fish, Fisheries and Aquaculture Sectional Committee, FAD 12

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Fish, Fisheries and Aquaculture Sectional Committee had been approved by the Food and Agriculture Division Council.

Considerable milestones have been reached in productivity of aquaculture products in the country. Concerns about food safety and quality, sustainability, environmental protection, worker safety and welfare have also gained importance. Thus, it is desirable to set up control and compliance systems for various kinds of aquaculture produce. In this context, it is necessary to pay attention to the quality of production practices requiring minute attention at different aspects of production, storage, handling and distribution.

In India, aquacultural practices are highly localized occupations and display a lot of variability in cultural practices and varietal preferences across regions. Further, with the opening up of the world market, there is a flow of trade in the aquacultural products. It is, therefore, necessary to define and assign certain common minimum standards to facilitate trade in these products and to win the confidence of the consumers within the country and outside.

Such standards envisaging focused approach for implementing good aquaculture practices, traceability etc. through appropriate infrastructure, record keeping and monitoring would reap following broad benefits:

a) Development of basic infrastructure at the field level,
b) Build up culture for good aquaculture practices by the farmers,
c) Uniform approach across farms regardless of their sizes
d) Increased awareness among the producers as well as the consumers about the need for consumption of good quality and safe food,
e) Traceability through complete integration of food chain,
f) Improvement in the environment,
g) Worker safety and welfare, and
h) Reputation in the international market as a producer of good quality and safe produce, and
j) Overcoming the Technical Barriers to Trade (TBTs).

This standard is part of a series of Indian Standards on Good Aquaculture Practices under development.

The composition of the Committee, responsible for the formulation of this standard is given at Annex A.

In formulation of this standard, considerable assistance has been provided by Indian Council of Agricultural Research - Central Institute of Brackishwater Aquaculture, Chennai (ICAR-CIBA). Contribution of Dr. K. K. Vijayan, Director, (ICAR-CIBA) is also duly acknowledged.

Indian Standard

REQUIREMENTS FOR GOOD AQUACULTURE PRACTICES — INDIA GAqP SHRIMP HATCHERY AND GROW OUT FARMS

1 SCOPE

This Indian Standard covers the control points and compliance criteria necessary to be followed by the producers (individual producers and/or members of a producer group) of shrimp hatchery and grow out farms.

2 TERMINOLOGY

For the purpose of this standard, the following terminologies shall apply:

2.1 Good Aquaculture Practices (GAqP) — Practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food aquaculture products.

2.2 Applicant Producer/Producer Group — Individual/organization that has applied for certification to India GAqP certification body.

2.3 Hazard — A biological, chemical, physical agent in, or condition of, with the potential to cause an adverse health effect.

2.4 Individual Producer — A person/organization legally responsible for on farm production, who retains ownership of all the produce covered in the India GAqP licence.

2.5 Inspection — An examination of all aquaculture practices in order to verify compliance to requirements specified in this standard.

2.6 Record — Document showing objective evidence of the tasks performed and results achieved.

2.7 Self-Inspection — Internal inspection of the registered product carried out by the grower on his/her farm using control points and compliance criteria.

2.8 Traceability — The ability to trace the history, use or location of a product (that is, the origin of materials and parts, processes applied to the product, or its distribution and placement after delivery) by means of a record.

2.9 Worker — Any person on the farm who has been contracted to carry out a task. This includes farm owners and managers.

2.10 Producer Group — A recognized group of producers applying for certification with an internal procedure and internal control of all the members registered to the India GAqP requirements, and complying the requirements as specified in this standard.

2.11 Field — Separate unit of land within a farm.

2.12 Farm — A farm is an agricultural production unit or group of agricultural production units, covered by same operational procedures, farm management.

2.13 Environment — Surroundings in which an activity takes place including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

2.14 Certification — All actions leading to the issuance of an India GAqP licence.

2.15 Standard Operating Procedure — A written document which details an operation, analysis, or action whose mechanisms are prescribed thoroughly and which is commonly accepted as the method for performing certain routine or repetitive tasks.

2.16 Major Requirement — The mandatory requirement that shall be fully complied with. In case of non-compliance, it will seriously affect the quality of freshwater aquatic animal as well as safety for consumers. It means that the requirement shall be complied with relevant laws and regulations as well.

2.17 Minor Requirement — The requirement that shall be mostly complied with. In case of non-compliance, it will affect the health of freshwater aquatic animal or product quality.

2.18 Veterinary Drug — Any substance applied or administered to any food-producing animal, whether used for therapeutic, prophylactic, or diagnostic purposes or for modification of physiological functions or behaviour.

3 CONTROL POINTS AND COMPLIANCE CRITERIA

3.1 Control points and compliance criteria required to be followed by the applicant producer (individual producer and/or member of a producer group) for independent verification of the aquaculture practices that have gone into the production of the produce are given in Table 1. In addition, the applicant producer (individual producer and/or member of a producer group) shall demonstrate compliance with all applicable statutory and regulatory requirements.

3.2 These criteria are marked as 'Major' or 'Minor' or 'Reco'. The criteria marked as 'Major' have a definite effect on the safety and quality of the produce and shall, therefore, be complied with, or shall give adequate assurance about the safety and quality of the produce. The criteria marked as 'Minor', though have a bearing on quality, and are those which, if implemented, would provide an advantage to the assessment for India GAqP certification. The criteria marked as 'Reco', are those, which though may not have direct bearing on safety and quality of produce but may have other benefits to the producer and are recommended for implementation and are advisory in nature.

3.3 For the purpose of verification, a grading pattern given below shall be followed for grant of India GAqP licence:

Category of Licence	*Compliance of Major Requirements* (*in, Percent*)	*Compliance of Minor Requirements* (*in, Percent*)
India GAqP — A	100	90
India GAqP — B	100	80
India GAqP — C	100	75

4 BIS INDIA GAQP CERTIFICATION

BIS India GAqP certification shall be as prescribed under the provisions of *Bureau of Indian Standards Act,* 2016 and Rules and Regulations framed thereunder. The details of the conditions under which the licence may be granted to producer (individual producer and/or member of a producer group) may be obtained from the Bureau of Indian Standards.

Table 1 Control Points and Compliance Criteria

(*Clause* 3.1)

Sl No.	Item	Compliance Level	Requirements	Inspection method
A-1	**HATCHERY AND SEED PRODUCTION**			
A-1.1	Hatchery registration	Major	Hatchery shall be registered with coastal aquaculture authority of India	Verification of registration certificate and allied documents
A-1.2	Hatchery site and location	Major	Hatchery shall be constructed at an environmentally suitably area, legally permitted coastal regulation zone (CRZ)	Verify that land has been selected based CRZ rules
A-1.3	Hatchery lay out	Minor	Various sections of the hatchery, such as brood stock maturation, larval rearing, live feed, laboratory, water intake, water treatments, effluent treatment, biological waste disposal, etc. should be identified from the lay out map	Verification of layout map and visual inspection
A-1.4	Hatchery infrastructure	Major	Different production systems in the hatchery shall be physically isolated to prevent cross contamination.	Examine the layout of farm. Visual inspection.
A-1.5	Biosecurity	Minor	Entrance to the hatchery should be restricted to the personnel assigned to work exclusively in this area and a record of personnel entering the facility should be maintained by the security personnel.	Visual inspection. Verify visitor policy.
A-1.6	Water treatment	Minor	Standard intake water treatment protocol should be used. Source water for the hatchery should be filtered and treated to prevent entry of disease vectors and any pathogens. Initial treatment should through filtration, by slow sand filter or rapid sand filters, and store in reservoir tanks. Following settlement, it should be chlorinated and de chlorinated. The water is then filtered through 1-5 µm cartridge filter, followed by UV sterilization and ozone treatment. Each functional unit should have separate water treatment system.	Verify the water quality records, and check the samples. Visual inspection of water treatment facilities.

Table 1 (*Continued*)

Sl No.	Item	Compliance Level	Requirements	Inspection method
A-1.7	Discharge treatment system	Major	No waste water shall be released out of the hatchery without chlorination and dechlorination, especially to prevent the escape of the larvae into the natural waters. Wastewater from each facility shall be released into special concrete or lined sedimentation tanks. From there it overflows into treatment tanks where the water shall be chlorinated and dechlorinated through aeration.	Verify the analyse report of the discharge water. Visual inspection
A-2	**BROODSTOCK MANAGEMENT**			
A-2.1	Broodstock procurement	Major	In the case of *Penaeus vannamei* hatchery, only SPF brood stock cleared through the quarantine shall be used in the hatchery for seed production. In *P. vannamei* hatchery, no other species shall be used for hatchery production. Use of pond reared broodstock strictly prohibited.	Visual inspection and verification of records.
A-2.2	Broodstock transportation	Minor	In the case of wild broodstock, healthy inter-molt animals without any external fouling, transport in individual brooder bag filled with clean chilled seawater and sufficient oxygenation. Activated charcoal and 10 ppm EDTA shall be added to prevent build-up of ammonia and chelating the heavy metals.	Visual inspection, and interview with hatchery operators.
A-2.3	Broodstock Quarantine	Major	Well maintained quarantine facility with separate water and aeration facility shall be provided. Animals are individually maintained after adequate prophylactic treatment. Individual animals shall be screened for WSSV and MBV and shall be transferred to maturation facilities.	Inspection and interview with hatchery operators.
A-2.4	Broodstock feed management	Minor	High quality fresh feed, possibly SPF feed shall be used. Feed shall be kept in a secure place that is able to prevent contamination and keep the quality of the feed.	Visual inspection, and interview with hatchery workers. Verification of feed management plan, if any.
A-2.5	Procedure for induced maturation	Minor	Farmers shall follow the standard operating procedure for induced maturation and spawning	Verification of records and existing SOP's.
A-2. 6	Procedure for spawning and Larviculture	Minor	Measures shall be in place to disinfect eggs according to standard operating procedures. Nauplii should collect through 60 to 100 µm net and wash under clean steady seawater, gather the nauplii and treat with 200 to 300 ppm formalin for 30 s and again treat with povione iodine (50 ppm) for one minute. Wash again with slow and current of sea water for 5 to 10 min. Stock in the larvicultutre tank at a stocking density of 100 no/L. In case abnormal mortality is found and target diseases are suspected, disease transmission shall be controlled and relevant competent authority shall be immediately informed.	Verification of records and existing SOP's.
A-3	**HATCHERY INPUTS : PROBIOTICS, PREBIOTICS, IMMUNESTIMULANTS**			
A-3.1	Appropriateness of biological and chemical inputs	Minor	Biological and chemical inputs applied shall be appropriate for the targeted disease or health condition. The current list of approved inputs from Competent Authority shall be available with hatchery personnel.	Verification of records.

Table 1 (*Continued*)

Sl No.	Item	Compliance Level	Requirements	Inspection method
A-3.2	Awareness of banned chemicals/anti-biotic	Major	Hatchery personnel shall be aware of the banned chemicals and antibiotic. Periodic residue analysis by accredited labs.	Verification of records and interview with workers.
A-4	**STORAGE OF FRESH FEED, EQUIPMENT, AND OTHER MATERIAL**			
A-4.1	Storage of fresh and dry feed	Minor	Fresh feed should be kept at isolated and secured place. Only authorized personnel shall have access to the place. Different form of frozen feed should have separate freezers.	Visual inspection and interview with hatchery workers.
A-4.2	Hatchery equipment	Minor	All the equipment such as nets, sieves shall be sterilized and kept in specific locations facilitating easy operation. Back up air compressors, pumps, motors, should be kept in a specific storage rooms.	Visual inspection and interview with workers
A-5	**TRAINING**			
A-5.1	Training to hatchery workers	Minor	Hatchery technicians shall attend period training conducted by State Department of Fisheries, Research organizations and University Department to update the new knowledge, analytical techniques, latest operational protocols, good management practices etc.	Verification of records and interview with workers.
A-6	**TRANSPORT**			
A-6.1	Broodstock transportation	Major	Transport time from landing centre/quarantine facility must be minimum. Preferably on cooler nights. Individual shrimp should be in separate brooder bag. The brooder bag contains one third clean sea water and two third of oxygen. Reduce the temperature of water in order to lower the metabolic activity. Follow the standard operating procedure for transportation, add 1 g of charcol/L of water to prevent the building up of ammonia and nitrate. Add 10 ppm EDTA to chelate heavy metals, and inhibit the bacterial growth.	Visual inspection and interview with workers.
A-6.2	Seed packing and transportation	Minor	A designated place in the hatchery for seed packing must be there. Standard operating procedures for packing of seeds need to be in place. Seed shall be sold to licenced farmer in the case of exotic species.	Verification of records and visual inspection.
A-7	**HATCHERY SANITATION**			
A-7.1	Personnel hygiene	Major	Hatchery workers should enter through dressing room, where they remove their street clothes and take a shower before entering another dressing room to put on working clothes and boots. At the end of the working shift, the sequence should be reversed. Workers shall be vaccinated for endemic communicable diseases and other immunization as required by regulatory authorities. There should be means provided for disinfection of vehicle tyres (tyre baths at the gate), feet (footbaths containing hypochlorite solution at >50 ppm active ingredient), and hands to be used upon entry and exit.	Visual inspection and interview with workers.
A-7.2	Effluents/ discharges	Minor	Effluents should be discharged to Effluent treatment system and properly disinfected before discharging out to the receiving ecosystem. Infected stocks should be incinerated properly.	Verification of records, visual inspection and interview with hatchery workers.

Table 1 (*Continued*)

Sl No.	Item	Compliance Level	Requirements	Inspection method
A-8	**TRACEABILITY**			
	Traceability	Major	Record shall be maintained for hatchery stock for traceability purpose.	Verification of records
B	**BRACKISHWATER SHRIMP FARMING — GROW OUT**			
B-1	Farm registration	Major	Farm shall be registered with Coastal Aquaculture Authority, India	Verification of the farm registration document
B-2	Biosecurity measures	Major	Farms must establish adequate bio-security measures including fencing, reservoirs, bird-scare, separate implements for each of the ponds etc.	Visual inspection.
B-3	Pond preparation	Minor	The recommended pond management practice shall be followed for preparation of pond before stocking.	Visual inspection and verification of SOP's.
B-4	Seed quality	Major	The seeds shall be procured from the licenced hatchery.	Verification of record
B-4.1	Seed stocking and initial management	Minor	Stocking seeds as per the stocking density approved by Coastal Aquaculture Authority.	Verification of record and assess from pond sampling
B-5	Soil and water management	Major	The recommended management practices shall be followed. Minimize the water exchange or follow zero water exchange system. Avoid the use of ground water.	Visual inspection and Verification of record.
B-6	Feed management	Major	Good quality feed shall be used. Usage of feeds containing antibiotics, pesticides, hormones, other harmful additives, microbial toxins and aflatoxins must be avoided. Feeds should have adequate water stability. Feeding shall be adjusted according to crop biomass, survival and feeding trays used for monitoring feed consumption.	Verification of record. Verify shrimp samples for adequateness of feeding.
B-7	Health management	Major	If the disease is found to be mild and non-infectious – carry out the corrective measures; disease treatment or improving general pond condition. If a mild infectious disease is detected in a pond with potential to spread within a farm, quarantine that pond and resort to the best possible option for disease treatment. If any serious infectious disease is detected which has the potential to spread widely, isolate the pond, harvest all the shrimp by adopting good sanitary practices. But, ensure that the water is not discharged into the environment before proper disinfections Take necessary precaution to avoid transfer of shrimp or equipments or anything used in the disease-affected pond to other ponds. Cooperating and communicating with neighbouring shrimp farmers regarding disease problem should be practiced so as to minimize the spread of disease. Information on disease outbreak shall be communicated to local regulatory authority.	Visual inspection and verification of records.

Table 1 (*Concluded*)

Sl No.	Item	Compliance Level	Requirements	Inspection method
B-8	Use of antibiotic and other chemicals	Major	Application of antibiotic/ chemical/drug shall be done according to the recommended practices. When necessary, use only those chemicals and drugs that are approved for use in aquaculture. Banned antibiotics and pharmacologically active substances shall be prohibited. Whenever permitted antibiotics/drugs/chemicals are used for disease treatment, make sure that withdrawal period are observed before harvesting the shrimp.	Verification of records.
B-9	Effluent management	Major	Minimize water exchange with surroundings. Switch over to the closed system or semi open system of aquaculture. While draining, there should be minimal re-suspension of sediments. If necessary, discharge of effluents must be done through a sedimentation pond, which will prevent re-suspension of sediment. It is also advisable to allow the effluents pass through a mangrove plantation. If there are no mangroves, efforts may be made for planting mangroves which is also an eco-friendly exercise. All aquaculture farms should have the effluent treatment systems of appropriate designs, stipulated in the regulations imposed by the Government.	Verification of records and interview with farm workers.
B-10	Harvest	Minor	Shrimp harvest and transportation must be planned in advance. Carryout necessary monitoring to ensure that the produce is residue free prior to harvest. Harvest and transportation should be carried out quickly and by following scientific methods to ensure freshness of the produce when it reaches the processing plants. Keep proper records of sale of shrimp from the farm.	Verification of records
B-11	Traceability and recall/ withdrawal	Major	Identification of harvested stock shall be maintained for traceability and recall/withdrawal, if needed.	Verification of records and SOP's.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Fish, Fisheries and Aquaculture Sectional Committee, FAD 12

Organization	*Representative(s)*
Indian Council of Agricultural Research, New Delhi	Dr Joykrushna Jena, (***Chairperson***)
Central Inland Fisheries Research Institute, Barrackpore	Dr Bijay Kumar Behera Shri Dharmendra Kumar Meena (*Alternate*)
Central Institute of Brackish Water Aquaculture, Chennai	Dr K. Ambasankar Dr Subhendu Kumar Otta (*Alternate*)
Central Institute of Fisheries Education, Mumbai	Dr Gopal Krishna Dr B. B. Nayak (*Alternate*)
Central Institute of Fisheries Technology (CIFT), Cochin	Dr K. Ashok Kumar Dr Madhusudana Rao (*Alternate*)
Central Institute of Fresh Water Aquaculture, Bhubaneswar	Dr Kedar Nath Mohanta Dr P. C. Das (*Alternate*)
Central Marine Fisheries Research Institute, Kochi	Dr A. K. Abdul Nazar
Coastal Aquaculture Authority, Chennai	Prof R. Jayaraman Shri S. Mani (*Alternate*)
Defence Food Research Laboratory, Mysore	Dr N. Gopalan
Export Inspection Council of India, New Delhi	Shri R. M. Mandalik
Fisheries Division, DAHD&F, Min. of Agriculture, GoI, New Delhi	Shri Paul Pandian Shri I. A. Siddiqui (*Alternate*)
Food Safety and Standards Authority of India, New Delhi	Ms Vinita Verma Dr Rajesh Kumar (*Alternate*)
National Fisheries Development Board, Hyderabad	Executive Director (Technical)
National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT), Cochin	Shri Varghese John Mr Kamal Raj (*Alternate*)
Sea Food Exporters Association of India, Alleppy	Shri Norbert Karikkassery
Society of Aquaculture Professionals, Chennai	President
The Marine Products Export Development Authority (MPEDA), Kochi	Joint Director Deputy Director (QC) (*Alternate*)
Kerala University of Fisheries and Ocean Studies, Kochi	Dr T. V. Sankar
All India Shrimp Hatchery Association	Shri D. Ramraj Shri K. Madhusudan Reddy (*Alternate*)
Director General, BIS (*Ex-officio Member*)	Shri P. Rajesh, Head (Food and Agriculture Department)

Member Secretary

Ms Navita Yadav

Scientist 'C' (Food and Agriculture Department), BIS

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